**2023UECM2453OE3a**

Start again

**Review of preview**

| | |
|---|---|
| **Started on** | Saturday, 1 April 2023, 04:36 PM |
| **Completed on** | Saturday, 1 April 2023, 04:37 PM |
| **Time taken** | 24 secs |
| **Marks** | 0/8 |
| **Grade** | **0** out of a maximum of 10 (**0**%) |

**1**

Marks: 1

For a stock:

S= 44; r = 0.031; δ = 0

An Asian arithmetic average price put with strike price 43 on the stock pays based on 3 monthly stock prices. It is valued using a binomial tree with u =1.1, d = 0.9. Calculate the option value. _____

Answer:

Make comment or override grade

Incorrect
Correct answer: 1.6819
Marks for this submission: 0/1.

**2**

Marks: 1

For a stock:

S= 74; r = 0.061; δ = 0

An Asian geometric average strike call on the stock pays based on 3 monthly stock prices. It is valued using a binomial tree with u =1.1, d = 0.9. Calculate the option value. _____

Answer:

Make comment or override grade

Incorrect
Correct answer: 2.7318
Marks for this submission: 0/1.

**3**

Marks: 1

For a RM-denominated Asian call option on 100 Thai Baht:

- The continuously compounded risk-free rate for Ringgit Malaysia is 0.055.
- The continuously compounded risk-free rate for baht is 0.012.
- The current exchange rate is B100 = RM12.8.
- The option will pay, at the end of three years, the excess of the arithmetic average dollar value of 100 Bahts at the ends of each of the three years over RM1.15.
- An otherwise similar Asian put option costs RM2.37.

Determine the value of the call option. _____

Answer:

Make comment or override grade

Incorrect
Correct answer: 13.2299
Marks for this submission: 0/1.

**4**

Marks: 1

An Asian arithmetic average price call option has a payoff based on the average of stock prices at the ends of each of three months from the date of issue. You are given:

- The underlying stock follows the Black-Scholes framework.
- The stock's volatility is 0.27.
- The continuously compounded risk-free interest is 0.047.
- The stock pays no dividends.
- The initial price of the stock is 77.
- The price of the stock one month after the date of issue is 73.0.
- The price of the stock two months after the date of issue is 75.0.
- The strike price is 72.

Calculate the value of this option at the end of two months. _____

Answer:

Make comment or override grade

Incorrect
Correct answer: 2.51
Marks for this submission: 0/1.

**5**

Marks: 1

You are given that:

- The current stock price is 55.
- The stock pays dividends continuously at a rate that is proportional to its price, the dividend yield is 0.03.
- The stock's volatility is 0.27.
- The continuously compounded risk-free interest rate is 0.073.
- A 1-year 46.2-strike up-and-out call with and up-and-out barrier of 65 has a Black-Scholes price of 10.6945.

Compute the Black-Scholes price of a 1-year 46.2-strike up-and-in call with an up-and-in barrier of 65. _____

Answer:

Make comment or override grade

Incorrect
Correct answer: 1.2636
Marks for this submission: 0/1.

**6**

Marks: 1

Assume the Black-Scholes framework for a future index. You are given that:

- The current index value is 1167.
- The index volatility is 47%.
- The continuously compounded risk free rate is 11%.

A 1-year 233-strike put option on a 1214.0-strike put option that matures 1.5 years from now has a price of 59.55. Compute the price of a 1-year 233-strike call option on a 1214.0-strike put option that matures 1.5 years from now. _____

Answer:

Make comment or override grade

Incorrect
Correct answer: 101.66
Marks for this submission: 0/1.

**7**

Marks: 1

Let x(t) be the value of €1 in terms of US dollars at time t. You are given that:

- The continuously compounded risk-free rate in US is 5.5%.
- Under the risk-neutral measure, the stochastic differential equation of x is

$$dx(t) = 0.025x(t)dt + 0.17d\ \tilde{}Z(t),\ x(0) = 0.9$$

  where ˜Z(t) is a standard Brownian motion under the risk-neutral measure.
- A call option that gives the option holder the right to pay $0.02 six months from today to buy a call option that gives the the right to buy €1 using $0.95 one year from now is costs $0.044.

Calculate the price of a put option that gives the option holder the right to sell at $0.02 six months from today a call that gives the right to buy €1 using $0.95 one year from now. _____

Answer:

Make comment or override grade

Incorrect
Correct answer: 0.015439
Marks for this submission: 0/1.

**8**
Marks: 1

A British company will receive $1,000,000 at the end of 6 month. To hedge its currency risk, it buys an option allowing to exchange dollars for pounds at a rate of £0.6/$. You are given:

- The spot exchange rate is £0.61/$.
- The continuously compounded risk-free interest rate for dollars is 0.06.
- The continuously compounded risk-free interest rate for pounds is 0.046.
- The volatility of the exchange rate between the two currencies is 0.11.
- The Black-Scholes framework is assumed to apply to the currency rate.

Calculate the cost in pounds of the hedge. _____

Answer:

Make comment or override grade

Incorrect
Correct answer: 16137
Marks for this submission: 0/1.